



# Nuclear Power Overview

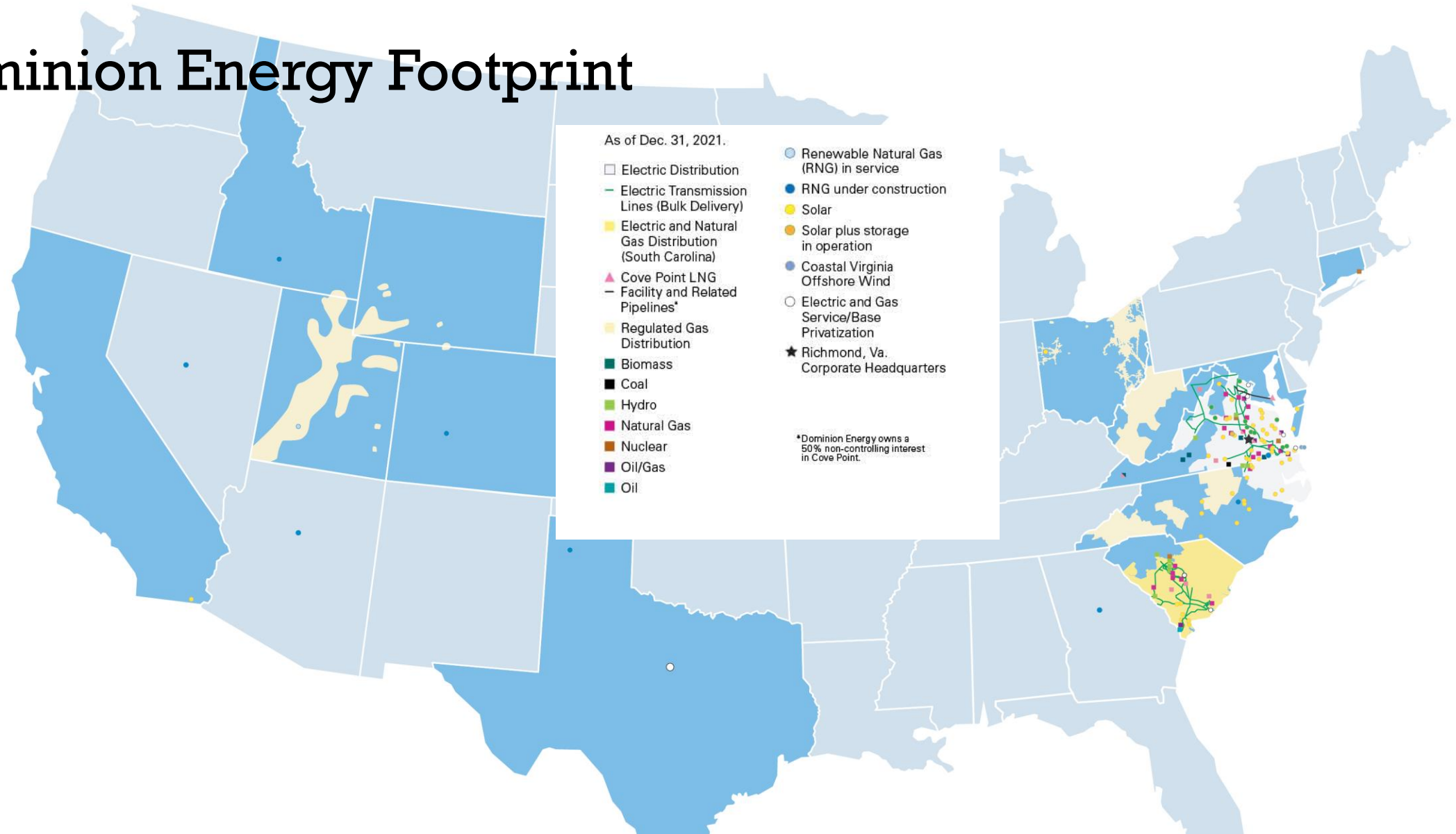
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April 11, 2022





# Dominion Energy Footprint





# Dominion Energy At-a-Glance

Employees: 17,100

State with Operations: 13

Customers: 7 million (8 states)

Market Cap: \$68 billion

Generating Capacity: 30.4 GW

Miles of Electric Lines: 88,700

Miles of Gas Pipeline: 101,700

# Dominion Energy's Nuclear Fleet



**Surry Power Station**  
Surry, VA



**Virgil C. Summer Power Station**  
Jenkinsville, SC



**North Anna Power Station**  
Mineral, VA



**Millstone Power Station**  
Waterford, CT



# Nuclear relicensing

## Virginia (cost-of-service investment)

- **20-year** license extensions
- **Rider-recovery eligible** (subject to approval)
- Significant **customer & environmental** value



# of units

Owned capacity (MW)

Regulated

Current license expiration

% of VA generation<sup>1</sup>

% of VA zero-carbon generation<sup>1</sup>

Estimated avoided CO2/year<sup>2</sup>

### Key milestones

NRC extension application

Estimated NRC approval

**Rider recovery filing**

Estimated rider approval

Surry

North Anna

2

2

1,676

1,672

✓

✓

2032/33

2038/40

15%

15%

45%

45%

8 million tons

8 million tons

✓ Q4 2018

✓ Q3 2020

1H 2021

1H 2022

**2H 2021**

**2H 2021**

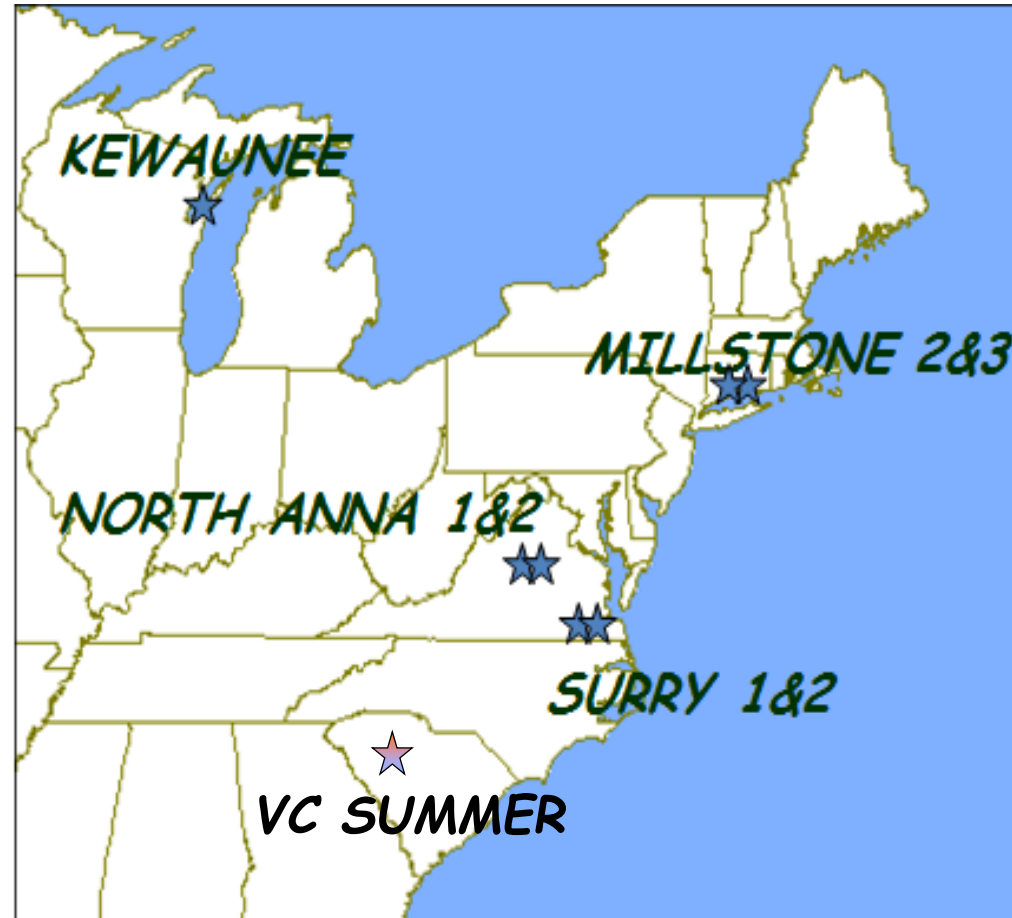
Mid-2022

Mid-2022

# Independent Spent Fuel Storage Installations

- Designated protected area, with concrete storage pad(s) and dry storage systems
- Licensed by the Nuclear Regulatory Commission under 10CFR Part 72
- Became necessary when the fuel storage pools began to reach capacity and the US Department of Energy breached their obligation to accept used commercial nuclear fuel beginning in 1998
- ISFSIs now present at almost all US commercial nuclear power plants

## Dominion Energy Nuclear Sites with *Independent Spent Fuel Storage Installations*



# North Anna





# Surry



# Millstone





# VC Summer



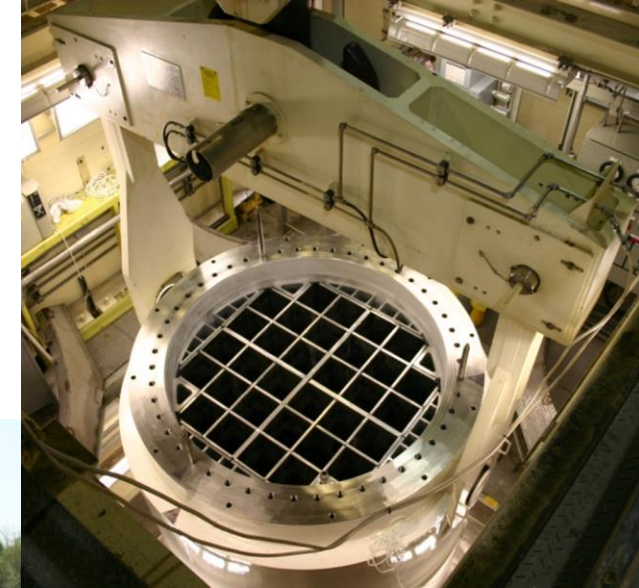
## Kewaunee (permanently shut down)





# Original Dry Storage Systems

- Vertical metal casks used initially at Surry (1986) and then North Anna (1998)
  - System includes the cask and a transporter
  - Bolted lids, with full-time lid seal monitoring
  - Surry was the first nuclear power plant in the US to construct and operate an ISFSI



# Next Generation Dry Storage Systems

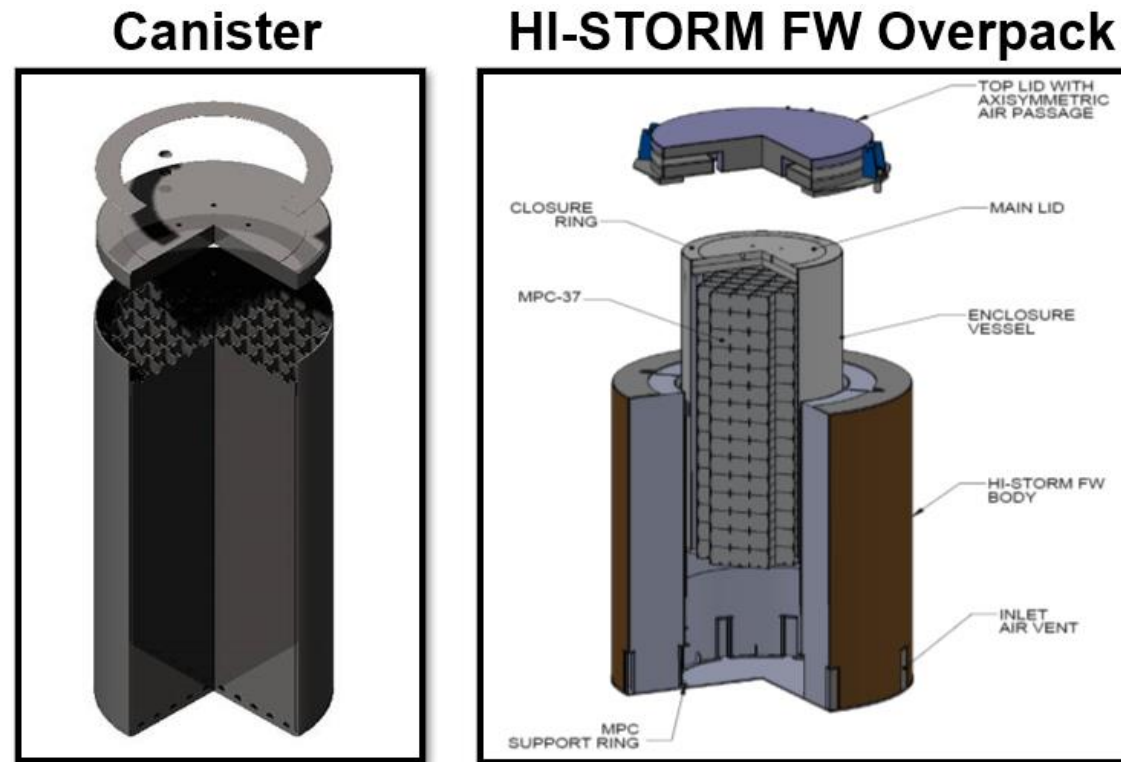
- Stainless-Steel canisters stored in concrete bunkers
  - Canisters, concrete modules, transfer cask, and trailer/tugger
  - Lids welded shut with redundant multi-pass welds
  - Canisters stored horizontally in the concrete bunker
- Millstone ISFSI began operation using Transnuclear's NUHOMS\* system in 2005
- North Anna and Surry transitioned to NUHOMS in 2007
- Kewaunee ISFSI opened in 2009 with NUHOMS





# Next Generation Dry Storage Systems

- VC Summer ISFSI operations began in 2016
  - Holtec HI-STORM FW system used
  - Same concept as NUHOMS (welded stainless-steel canister in a concrete overpack), only vertical



Dominion Energy Independent Spent Fuel Storage Installations												
	North Anna			Surry				Millstone		Kewaunee		VC Summer
Cask Vendor	Transnuclear (Orano)			GNSI Westinghouse NAC	Transnuclear			Transnuclear		Transnuclear	NAC	Holtec
Cask Type	TN-32	NUHOMS 32PTH	NUHOMS EOS	Castor, MC10, I-28	TN-32	NUHOMS 32PTH	NUHOMS EOS	NUHOMS 32PT	NUHOMS EOS	NUHOMS 32PT	MAGNASTOR	MPC-37
Initial Load Date	1998	2008	2021	1986	1998	2007	2022	2005	2027	2009	2017	2016
Number of Casks	28*	40	3 of 46	28	27 of 28	40	0 of 30	47 of 67	0 of 68	14	24	12 of 98
Total Casks on Site	71			95				47		38		12
2022 ISFSI Loading Plan	3 casks			3				5		-		4 (complete)
* includes the TN-32B High Burnup Demonstration Cask loaded in 2017												

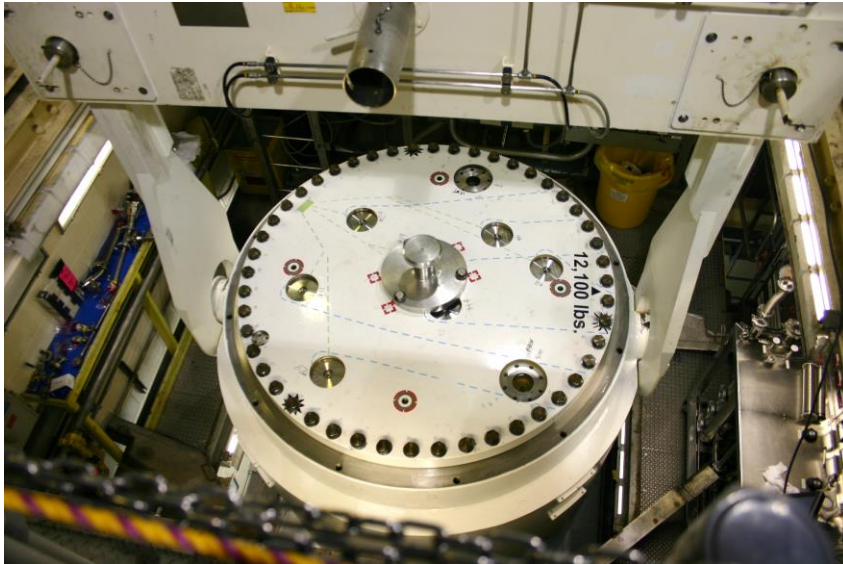


# North Anna High Burnup Cask Demonstration Project

- Purpose: obtain actual data on high burnup spent fuel in dry storage to prove it is safe and stable, and can be safely transported off-site to a repository
- Initiated in 2012 by Dominion
  - We have our own site ISFSI license, and experience with bolted lid casks, high burnup fuel ( $> 45$  GWd/MTU) from both fuel vendors, and demonstration programs
- Funded by the Dept of Energy and Electric Power Research Institute
- Dominion partnered with EPRI, Orano Federal Services, Transnuclear, Framatome, and Westinghouse
  - Developed test plan and fuel loading (2013)
  - Procured a new bolted lid TN-32 cask (2014)
  - Modified cask lid to accept thermocouples (2015-16)
  - Dominion submitted license amendment application to NRC (2015)
  - NRC approved the amendment (August 2017)

# North Anna High Burnup Cask Demonstration Project

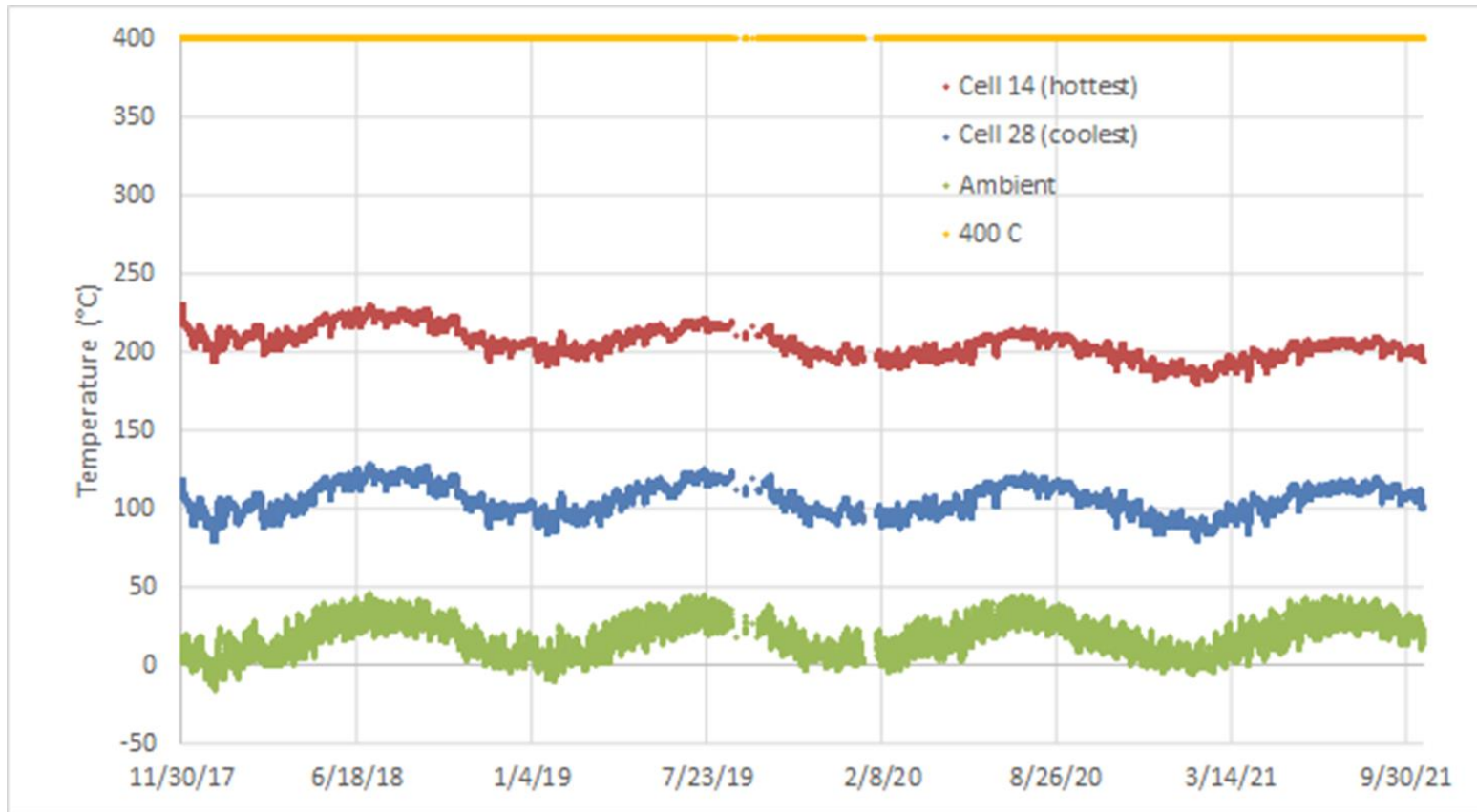
- Cask loaded in November 2017 and placed at the ISFSI
- Temperature data from 63 thermocouples recorded hourly





# North Anna High Burnup Cask Demonstration Project

- Fuel temperature data shows expected slow, steady decline
- Natural variations in ambient temperature also seen inside cask



# North Anna High Burnup Cask Demonstration Project

- Next Steps
  - Cask vendor Orano obtains transportation license (application submitted in 2021)
  - Prepare cask for loading onto conveyance and rail shipment ~2026
  - Dept. of Energy assumes ownership for shipment, receives cask (likely at a national lab) and performs additional inspections on fuel after transport